DOE R&D CONFERENCE

01/29/2014

Tampa, Florida

Fred Maxik

FUTURE OF AGRICULTURAL GROW LIGHTS

LightingScience

MAXIK LABS

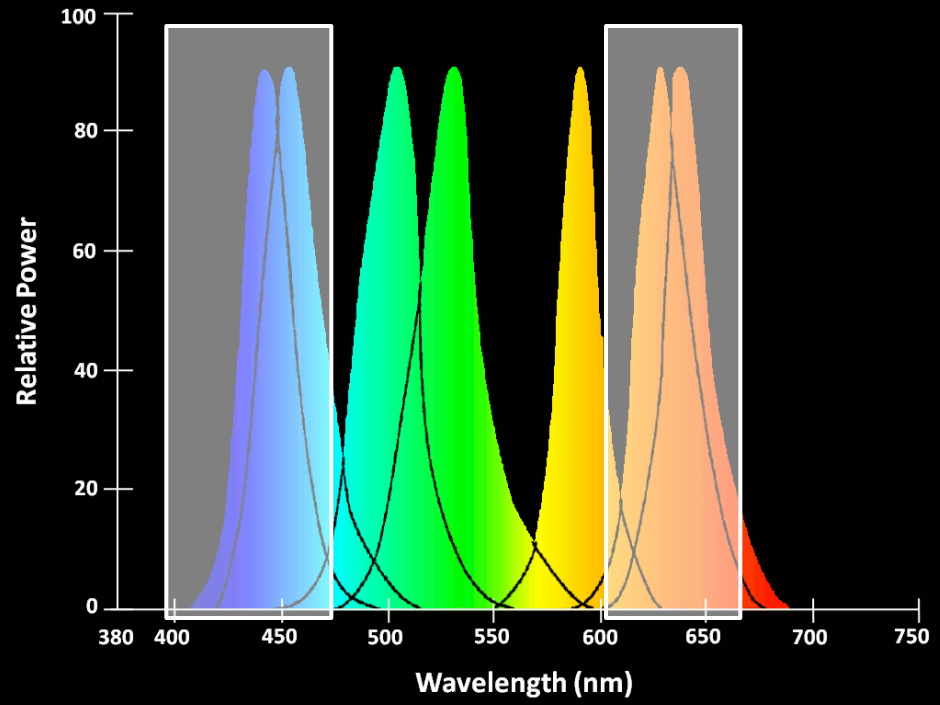
Plant Growth

Light and Plants

- Light intensity increases plant growth
- Day length determines fruiting cycle
- Spectrum to promote vegetative growth
- Light uniformity for maximum crop yield

Applications of Spectrum Specific Lighting

Highest rates of photosynthesis: between 400-480nm and 620-680nm

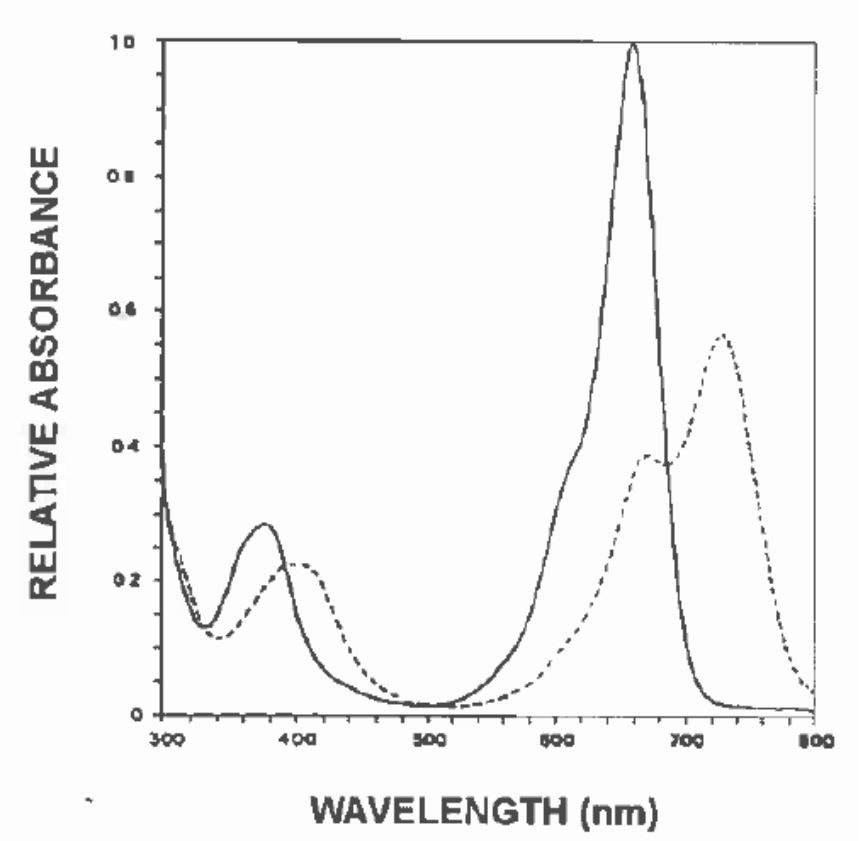


Multiple LED Spectrums, Various Colors

- Plant lighting
  - Incorporate wavelengths that increase photosynthesis and photomorphogenesis in gardens and greenhouses

MAXIK LABS

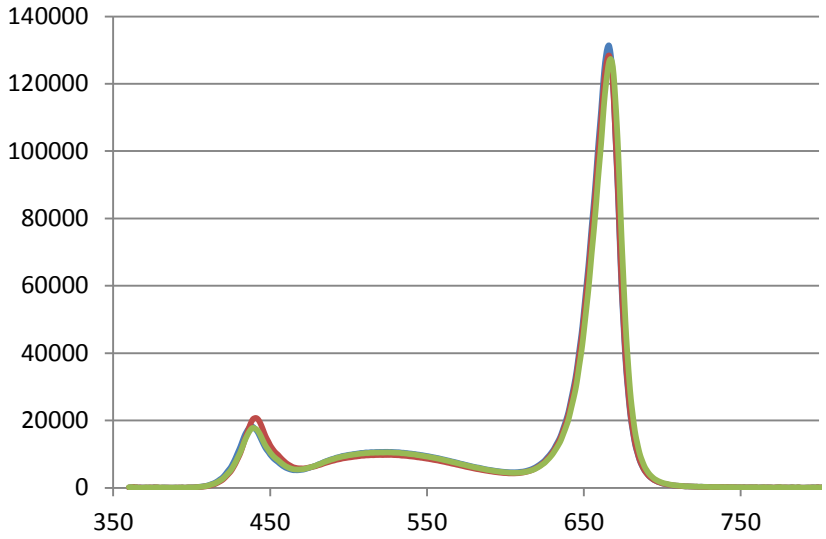
Plant Spectrum

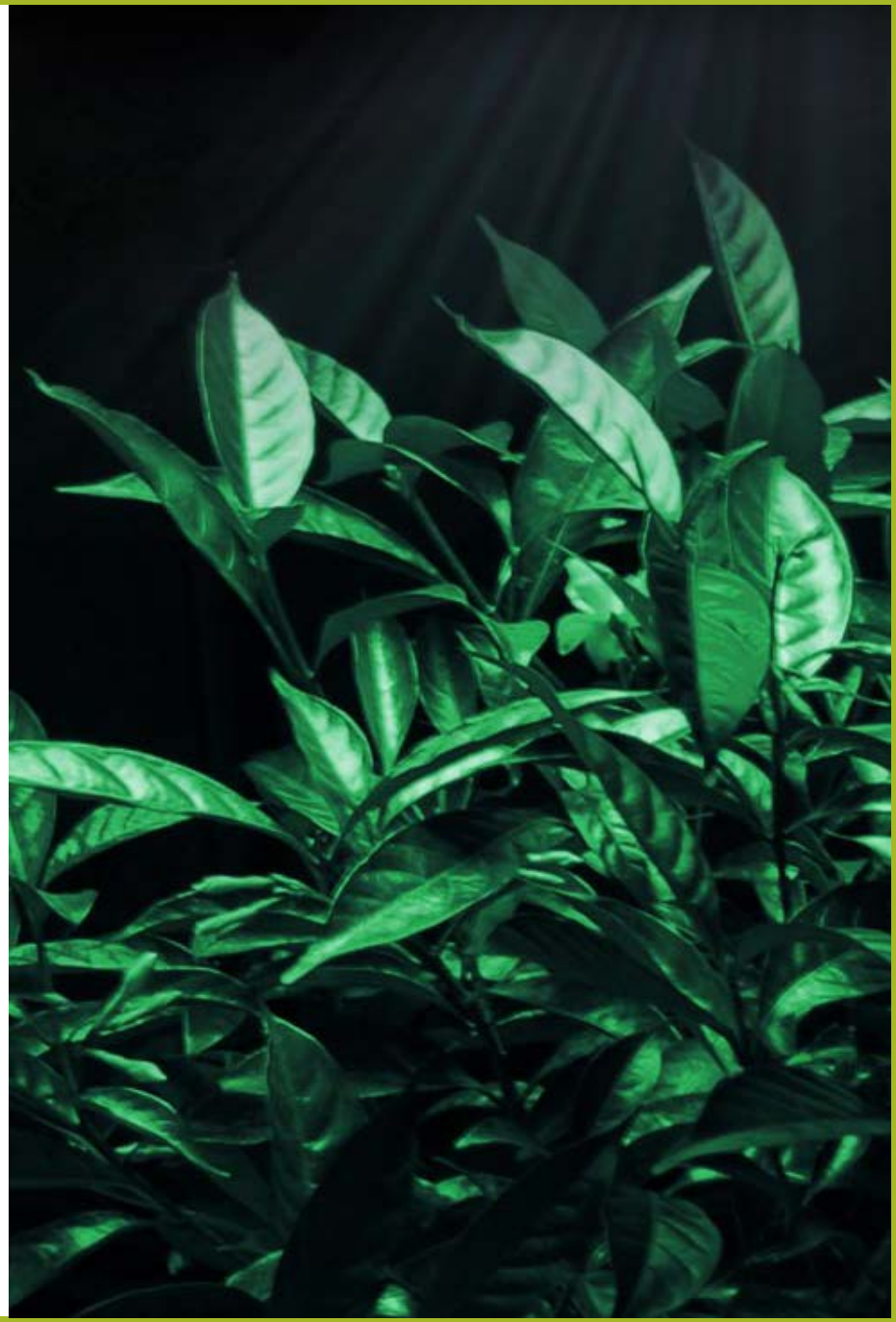


- Heightened blue and red spectrum for optimized photosynthetic response

Plant Spectrum

- Manipulated spectrum





Why LED Grow Lights?

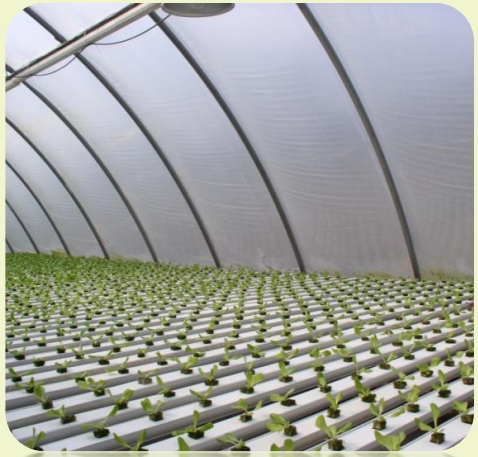
Food safety

- Urban Food Production
- World wide scarcity of farmland

Specific Growing Applications

(living art, propagation, food source)

- Extended growing season
- Controlled environment- secure conditions for seedlings
- Remove Geographical limitations



Future Grow Light Technology

Bio fuels Medical technology Extreme conditions Agricultural Sustainability

All this can be achieved with LED technology

TARGETED APPLICATIONS

Indoor Farming

Propagation

Living Walls

Floriculture

AgroTech

Hobbyist

Olericulture

Hydroculture

Pharmaceutical

AGROTECHNOLOGY

Plant product for use in technology, pharmaceutical and experimental research facilities.

INDOOR FARMING

Propagation, Olericulture, floriculture, hydroculture

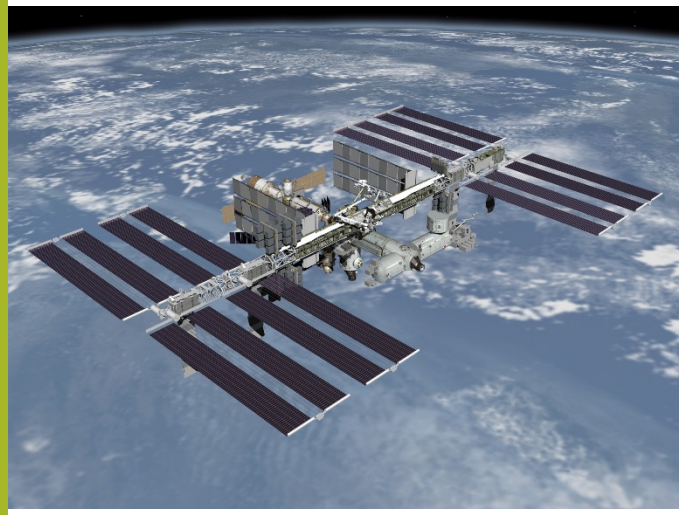
Propagation

Olericulture

Floriculture

Hydroculture

- No soil or odor
- Faster growth
- Eliminate soil originating diseases or pests
- Ease of maintenance



LED vs Traditional Sources

- Fully Controllable Spectrum
- Light Intensity
- Heat Management
- Energy Savings
- Optical Flexibility
- Long Life